

be described relative to the strap 20 of Figure 4, but this is for illustration and is not to limit the invention. The strap 20 is advantageously a plumbing strap containing undulations, such as flutes 39, as described above. But straps and the various pipe supports without the undulations could be used.

**[0082]** A protective cover 50 has a first, open end 52 fastened to the strap 20 and an opposing second end 54 covering the distal end of the pipe 22. Advantageously a seal is provided between the cover 50 and the pipe 22 to prevent gas and/or water from pipe 22 from passing out of the cover 50. The second end 54 is shown as comprising a cap threaded onto the end of the cover 50, to compress a resilient seal member 56 against the pipe 22. The seal member 56 advantageously comprises an O-ring seal, and is shown in Fig. 14 as being a radial seal. The seal 56 thus preferably comprises a radial seal located so that the seal is interposed between an exterior circumference of the pipe 22 and an interior circumference of the cover 50 during use of the plumbing device.

**[0083]** Alternatively, the seal 56 could be an axial seal located on the inside of the end cap forming the second end 54 with the seal held against the end of the pipe 22, as indicated in Figures 14 and 18, in which case the cover 50 could comprise a single piece, or a multi-part piece. The seal 56 can thus alternatively comprise an axial seal located so that the seal is interposed between the distal end of the pipe and the cover during use of the plumbing device. Further, the cover 50 can advantageously have a removable distal end 54 as shown in Fig. 14, and the seal 56 can be located so that the seal is axially compressed between the removable distal end of the cover and the distal end of the pipe during use of the plumbing device.

**[0084]** The first end 52 of the cover 50 is releasably connected to the strap 20. As shown in Figures 15-25, projections on the first end 52 advantageously engage or are held to strap 20. Preferably the first end 52 has bayonet projections 58 which are sized and located to pass through mating openings 60 engage the opposing side of the strap 20. After passing through the openings 60 the projections 58 are rotated in the plane of the strap 20 to a position where they engage the side of the strap 20 opposite the major portion of the cover 50, to lock the cover against axial movement along the axis 37 of pipe 22. Preferably the projections 58 are resiliently urged against the strap 20 during the rotation.

**[0085]** The projections 58 hold the cover 50 from sliding off the pipe 22 during construction

of the building in which the pipes 22 are located, and are sufficiently strong for that purpose. Further, the projections 58 need to hold the cover 50 in place when the pipes 22 are pressurized to prevent the cover 50 from blowing off and leaking fluid (gas or liquid). Some extra strength in the projections 58 is preferably added as a safety factor. The cover 50 can be removably attached to the strap 50 by various ways, but the bayonet connection provides an easily achieved, single-part connection.

[0086] As shown in Fig. 23-25, there are preferably secondary openings 62 adjacent the openings 60 through which the bayonet projections 58 are inserted. The openings 60 preferably take the form of slots and are arcuate and concentric with the holes 26 through which the pipe 22 extends (Fig. 4). The further openings 62 are also preferably concentric with each slot 60, the openings 60, 62 being configured so they can accommodate a bayonet mount during use. The distal ends of the projections 58 engage these openings 62 to removably hold the projections in place. Thus, the projections are preferably resiliently urged into the openings 62 to lock them in place. If the strap 20 has the above-described undulations, the openings 60, 62 are preferably radially outside the undulations, or alternatively are spaced intermediate the undulations.

[0087] Figure 21 shows a further embodiment of the cover 50 in which the projections comprise snap-in projections 64. The projections 64 have a tapered portion 66 on an elongated member so the tapered portion can slide through the opening 60 in the strap 20, usually by deforming radially inward or outward. After the tapered portion 66 passes through the strap, the projection is resiliently urged so the lip 68 engages the side of the strap 20 opposing the major portion of body 50. The projections 64 thus advantageously comprise resilient members having a tapered portion 66 on a distal end of the projections to releasably and resiliently engage the additional openings 60 in the support 20 during use.

[0088] As shown in Figure 21, the distal, second end 54 of the cover 50 advantageously has an axial seal 56 in it. The seal 56 could be omitted entirely in which case no fluid-tight seal would be provided. Alternatively, a radial seal of the type shown in Figure 14 could be used, or other radial seals.

[0089] Referring to Figure 25, a strap 24 having undulating edges of the type described in this application is shown, but with the openings 60, 62 also provided at each opening 26. The

openings 60, 62 are preferably provided around each hole 26, but could be provided around any desired number of holes 26.

**[0090]** The cover 50 can be made of various materials and sized sufficient to protect the pipe 22 from being damaged, and preferably to withstand the pressures and forces exerted on cover 50 when the pipes 22 are pressurized with the fluid that will pass through the pipes during their normal use or during testing of the pipes. Plastic materials are preferred, such as ABS, polyethylene, polyurethane, etc.

**[0091]** The pipe support 20 thus provides a support for the pipe, with the support having a first hole 26 (Fig. 1) through which the pipe extends a given distance. The pipe support or strap 20 has additional openings 60, 62, around the hole 26 through which the pipe 22 extends. The cover 50 is preferably fluid tight. It has a first, open end sized to fit over the pipe during use. The cover 50 has projections 58, 64 extending beyond the open end and located to correspond with the location of at least some of the openings 60, 62 in the strap 20. The projections 58, 64 are configured to engage the at least some openings 60, 62 to fasten the cover 50 to the support 20 during use of the cover. The cover 50 also has a closed, distal end that extends beyond the distal end of the pipe during use when the cover is installed. The fluid seal 56 is interposed between the cover 50 and the pipe 22 during use of the device so as to prevent the passage of fluid from the pipe past the seal.

**[0092]** There is also provided a method of temporarily protecting a pipe 22 having a distal end with an opening through which fluid flows during use of the pipe, where the pipe extends through a hole 26 in the plumbing support which is fastened to a building support. The method comprises placing a fluid tight cover 50 over the distal end of the pipe 22. The cover 50 has a first, open end sized to fit over the pipe during use of the device. The cover 50 has resilient projections 58, 64 at the open end. The cover 50 also has a closed, distal end that extends beyond the distal end of the pipe 22 during use of the device. A seal 56 is located on the inside of the cover and interposed between the cover and the pipe. The seal 56 is engaged with the pipe to prevent the passage of fluid from the pipe past the seal. The projections on the cover engage mating openings in the plumbing support 20 to restrain movement of the plumbing device along the length of the cover.

**[0093]** The method advantageously, but optionally, further includes providing the cover 50 with a removable distal end 54. In this embodiment the seal 56 can be located between the removable